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The mortality experience on risks insured for...

[New York]

1919

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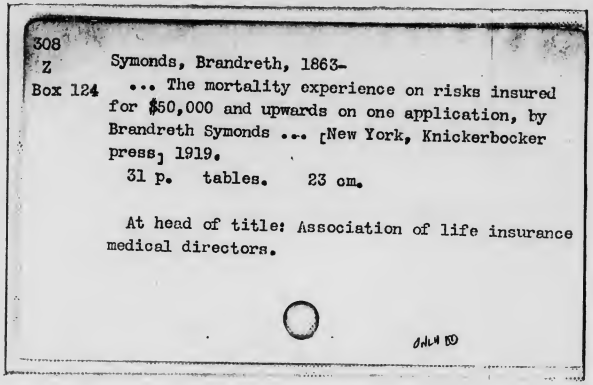

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Association of
Life Insurance Medical Directors

The Mortality Experience on Risks Insured for $50,000 and Upwards on One Application

Compliments of
Dr. Brandreth Symonds
7-12-21

By
Brandreth Symonds, M.A., M.D.

1919

M.W.L. aug. 15, '23

THE MORTALITY EXPERIENCE ON RISKS INSURED FOR $50,000 AND UPWARDS ON ONE APPLICATION.

By Brandreth Symonds, M.A., M.D.,

Chief Medical Director, The Mutual Life Insurance Company of N. Y.

The following report is based on the mortality experience of the risks insured in the Mutual Life for $50,000 and upwards on one application during the thirty-one years from 1885 to 1915 both inclusive, observed to the policy anniversary in 1916. The expected deaths and losses were based on the Medico-Actuarial Table. This experience relates to *men* only who were insured in the United States and Canada for $50,000 and upwards on one application or on different applications but all within three months. No applicant is included whose total insurance aggregated $50,000 but which was issued over a greater interval than three months. Cases issued for $50,000 and subsequently reduced were taken throughout. Policies exchanged for reduced paid-ups or for extended term insurance were treated as terminated. The method of treatment with reference to age, duration, etc., was similar to that adopted by the Medico-Actuarial Mortality Investigation.

These statistics are divided into three periods, the first period covering the years of issues of 1885 to 1895; the second

from 1896 to 1905; and the third period from 1906 to 1915. They are further divided into three classes.

Class I—$50,000 to $100,000 inclusive.
Class II—over $100,000 to $250,000 inclusive.
Class III—over $250,000.

The number and amount insured, the years of exposure, the number and amount terminated by death, and the number and amount existing at the close of the observation period in 1916 in each period and class are set forth in the following table, in which the average age at issue and the average duration are also given.

TABLE A

ISSUES OF 1885 TO 1895

Class	Insured No.	Insured Amount	Years of Exposure No.	Years of Exposure Amount	Terminated by Death No.	Terminated by Death Amount	Existing at Close of Observation No.	Existing at Close of Observation Amount	Ave. Age at Issue	Ave. Dur.
I	917	$61,487,000	7,828	$479,627,100	149	$8,914,200	82	$4,871,100	39.8	8.6
II	19	2,288,000	156	17,536,800	4	451,700	4	440,600	45.5	8.2
III	1	452,000	1	452,000	...	.....	...	.....	50.0	1.0
Total	937	64,227,000	7,985	497,615,900	153	9,365,900	86	5,311,700	40.0	8.6

ISSUES OF 1896 TO 1905

I	1,461	101,003,400	8,554	534,229,000	115	6,688,600	294	18,146,000	42.3	5.9
II	134	20,137,600	1,002	134,699,200	11	1,421,400	39	5,127,700	43.6	7.5
III	27	13,848,200	160	92,217,200	4	2,575,000	6	3,908,000	45.1	5.9
Total	1,622	134,989,200	9,716	761,145,400	130	10,685,000	339	27,181,700	42.5	6.0

ISSUES OF 1906 TO 1915

I	1,079	69,522,050	4,034	255,941,750	36	2,413,300	697	42,977,700	42.6	3.7
II	94	14,761,000	392	61,168,100	5	820,000	55	8,098,000	43.1	4.2
III	10	3,614,600	41	14,217,200	1	273,300	6	2,441,300	41.1	4.1
Total	1,183	87,897,650	4,467	331,327,050	42	3,506,600	758	53,517,000	42.6	3.8

TABLE A—*Continued*

ISSUES OF 1885 TO 1915

Class	Insured No.	Insured Amount	Years of Exposure No.	Years of Exposure Amount	Terminated by Death No.	Terminated by Death Amount	Existing at Close of Observation No.	Existing at Close of Observation Amount	Ave. Age at Issue	Ave. Dur.
I	3,457	232,012,450	20,416	1,269,707,850	300	18,016,100	1,073	65,004,800	41.8	5.9
II	247	37,186,600	1,550	213,404,100	20	2,693,100	98	13,666,300	43.5	6.3
III	38	17,914,800	202	106,886,400	5	2,848,300	12	6,349,300	43.8	5.3
Total	3,742	287,113,850	22,168	1,590,088,350	325	23,557,500	1,183	86,010,400	42.0	5.9

The following table shows the relative mortality in each period and class both on applications and amounts.

TABLE B

$50,000 AND UPWARDS ON ONE APPLICATION

ISSUES OF 1885–1895—EXPOSED TO 1916

Class	ON APPLICATIONS Expos.	DEATHS Act.	DEATHS Expected	Ratio	ON AMOUNTS Exposures	DEATH-CLAIMS Actual	DEATH-CLAIMS Expected	Ratio
I	7,828	149	128.599	115.9	$479,627,100	$8,914,200	$7,784,879	115.0
II	156	4	3.809	104.8	17,536,800	451,700	426,344	106.1
III	1	...	.009	.....	452,000	.....	4,113	.....
Total	7,985	153	132.417	115.5	497,615,900	9,365,900	8,215,336	114.3

ISSUES OF 1896–1905—EXPOSED TO 1916

I	8,554	115	114.811	100.2	$534,229,000	6,688,600	6,986,508	95.6
II	1,002	11	13.175	83.5	134,699,200	1,421,400	1,693,729	83.9
III	160	4	1.741	229.6	92,217,200	2,575,000	890,268	288.4
Total	9,716	130	129.727	100.2	761,145,400	10,685,000	9,576,505	111.1

ISSUES OF 1906–1915—EXPOSED TO 1916

I	4,034	36	38.008	94.7	255,941,750	2,413,300	2,435,770	98.9
II	392	5	3.778	132.5	61,168,100	820,000	626,306	131.2
III	41	1	.271	369.0	14,217,200	273,300	90,131	303.4
Total	4,467	42	42.057	100.0	331,327,050	3,506,600	3,152,607	111.2

TABLE B—*Continued*

ISSUES OF 1885–1915—EXPOSED TO 1916

Class	ON APPLICATIONS				ON AMOUNTS			
	Expos.	DEATHS		Ratio	Exposures	DEATH-CLAIMS		Ratio
		Act.	Expected			Actual	Expected	
I	20,416	300	281.418	106.8	1,269,797,850	18,016,100	17,207,157	104.7
II	1,550	20	20.762	96.2	213,494,100	2,693,100	2,746,379	98.0
III	202	5	2.021	247.5	106,886,400	2,848,300	990,512	287.7
Total	22,168	325	304.201	106.9	1,590,088,350	23,557,500	20,944,048	112.6
Deduct reinsurance					70,287,900	1,792,700	609,081	294.0
Total					1,519,800,450	21,764,800	20,334,967	107.3

Class I—$50,000 to $100,000—shows a gradual improvement in the mortality by policies at the different periods, the ratio being 116% for the first period, 100% for the second period, and 95% for the third period. There is also a marked improvement in the mortality by amounts in the second period, but not so in the third, the ratio being 115% for the first, 96% for the second, and 99% for the third period. Class II—over $100,000 to $250,000—shows a marked improvement in the mortality by policies and amounts in the second period, from 105% by numbers and 106% by amounts in the first period, to 84% by numbers and amounts in the second period; it rises again in the third period to 133% by numbers and 131% by amounts. There was but one policy issued in the first period belonging to class III—over $250,000—which was lapsed at the end of the first year. In the second period there were four deaths, giving a mortality ratio of 230% by policies and 288% by amounts; and in the third period there was one death, causing a ratio of 369% by numbers and 303% by amounts. Combining the three periods, Class I shows 107% by policies and 105% by amounts; Class II, 96% by numbers and 98% by amounts, and Class III, 248% and 288% for numbers and amounts respectively.

In all the cases under Class III as well as in some cases

under Classes I and II the Mutual Life had reinsured in other companies sixty-two lives for $12,041,600. Of these, eight terminated by death from which we recovered $1,792,700 in claims. This reinsurance shows a very high mortality ratio of 316% by *lives* and 294% by amounts. After deducting this reinsurance from the grand total, the loss ratio is reduced from 112.6% to 107.3%.

A summary of the experience by ages at issue and by policy years is set forth in the following table.

TABLE C

CLASS I—$50,000 TO $100,000

SUMMARY BY AGES, ALL POLICY YEARS COMBINED

ISSUES OF 1885 TO 1895—EXPOSED TO 1916

Ages	ON APPLICATIONS				ON AMOUNTS			
	Expos.	DEATHS		Ratio	Exposures	DEATH-CLAIMS		Ratio
		Act.	Expected			Actual	Expected	
15–19	....	...	.....	....	.....	.....	.....	...
20–29	905	9	4.689	191.7	$58,659,400	$575,000	$300,337	191.5
30–39	2,341	29	19.007	152.5	136,821,800	2,036,700	1,095,786	185.7
40–49	3,030	51	48.853	104.0	188,305,900	2,740,100	3,013,555	90.7
50–59	1,321	45	41.718	108.0	82,359,700	2,743,300	2,554,966	107.5
60 & Ov.	231	15	14.332	104.7	13,498,300	819,100	818,235	100.0
Total	7,828	149	128.599	115.9	479,627,100	8,914,200	7,784,879	115.0
ISSUES OF 1896 TO 1905—EXPOSED TO 1916								
15–19	51	...	.235	....	4,415,000	.....	20,374	...
20–29	804	2	3.966	50.4	47,117,300	100,000	230,271	43.5
30–39	2,564	18	16.138	111.6	158,449,000	1,030,900	981,006	105.2
40–49	3,223	46	36.531	126.0	206,243,700	2,810,800	2,307,657	121.7
50–59	1,559	36	36.935	97.6	97,228,200	2,027,800	2,256,526	89.6
60 & Ov.	353	13	21.006	61.9	20,774,900	719,100	1,190,674	60.4
Total	8,554	115	114.811	100.2	534,229,000	6,688,600	6,986,508	95.6
ISSUES OF 1906 TO 1915—EXPOSED TO 1916								
15–19	22	...	.089	....	1,450,000	.....	5,840	....
20–29	229	4	.990	404.0	14,755,000	270,000	63,657	423.9
30–39	1,248	7	6.309	110.6	75,308,000	460,000	378,041	121.4
40–49	1,638	10	13.295	75.2	107,400,650	771,000	878,402	87.9
50–59	792	14	13.364	104.9	49,863,100	862,300	844,559	101.8
60 & Ov.	105	1	3.961	25.3	7,165,000	50,000	264,371	19.0
Total	4,034	36	38.008	94.7	255,941,750	2,413,300	2,435,770	98.9

TABLE C—*Continued*

ISSUES OF 1885 TO 1915—EXPOSED TO 1916

Ages	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
15–19	73	...	.324	....	5,865,000	.....	26,214	....
20–29	1,938	15	9.645	156.0	120,522,700	945,000	594,265	158.8
30–39	6,153	54	41.454	130.1	370,579,700	3,527,600	2,455,733	143.6
40–49	7,891	107	98.679	108.1	501,950,350	6,321,900	6,201,614	101.8
50–59	3,672	95	92.017	103.6	229,442,000	5,633,400	5,656,051	99.7
60 & Ov.	689	29	39.299	73.7	41,438,200	1,588,200	2,273,280	70.0
Total	20,416	300	281.418	106.8	1,269,797,850	18,016,100	17,207,157	104.7

SUMMARY BY POLICY YEARS, ALL AGES COMBINED

ISSUES OF 1885 TO 1895—EXPOSED TO 1916

Policy Years								
1	917	4	5.563	72.0	61,487,000	253,800	369,489	68.8
2	623	3	5.365	55.8	39,657,100	200,000	339,645	58.8
3	533	8	5.281	151.2	33,131,600	502,700	325,975	154.3
4	400	10	4.903	204.0	28,019,700	577,500	295,822	195.2
5	425	9	4.743	189.9	25,765,200	495,000	286,666	172.3
1–5	2,958	34	25.855	131.2	188,061,600	2,029,000	1,617,597	125.4
6–10	1,815	26	25.361	102.4	109,916,100	1,715,700	1,528,866	112.2
11–15	1,451	32	28.449	112.6	86,527,000	1,933,200	1,604,112	114.1
16–20	1,138	37	30.556	121.0	67,475,000	2,191,300	1,807,570	121.2
21 & Ov.	466	20	18.378	108.8	27,646,400	1,045,000	1,136,734	92.0
1–31	7,828	149	128.599	115.9	479,627,100	8,914,200	7,784,879	115.0
6–31	4,870	115	102.744	112.0	291,565,500	6,885,200	6,167,282	111.5

ISSUES OF 1896 TO 1905—EXPOSED TO 1916

1	1,461	4	9.208	43.6	101,003,400	238,200	632,726	37.6
2	747	6	6.684	90.0	46,652,000	245,000	415,138	59.0
3	690	5	6.847	73.0	42,944,500	266,600	421,753	63.2
4	623	9	6.764	133.2	38,577,600	635,000	414,492	153.7
5	575	8	6.762	118.4	35,310,700	404,100	412,178	98.2
1–5	4,096	32	36.265	88.0	264,488,200	1,788,900	2,296,287	77.8
6–10	2,414	30	35.144	85.5	147,079,600	1,866,100	2,119,055	88.1
11–15	1,565	39	30.852	126.4	94,128,500	2,294,600	1,824,150	125.7
16–20	479	14	12.550	111.6	28,532,700	739,000	747,910	99.0
1–20	8,554	115	114.811	100.2	534,229,000	6,688,600	6,986,508	95.6
6–20	4,458	83	78.546	105.4	269,740,800	4,899,700	4,690,221	104.4

TABLE C.—*Continued*

ISSUES OF 1906 TO 1915—EXPOSED TO 1916

Policy Years	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
1	1,079	11	6.791	161.7	69,522,050	727,300	441,434	165.1
2	790	6	6.757	88.8	49,660,800	475,000	432,004	109.7
3	679	3	6.438	46.5	42,993,800	200,000	416,989	48.0
4	522	5	5.485	91.0	33,031,400	350,000	352,571	99.1
5	382	1	4.424	22.6	24,258,400	100,000	282,181	35.5
1–5	3,452	26	29.895	86.8	219,466,450	1,852,300	1,925,179	96.1
6–10	582	10	8.113	123.0	36,475,300	561,000	510,591	110.0
1–10	4,034	36	38.008	94.7	255,941,750	2,413,300	2,435,770	98.9

ISSUES OF 1885 TO 1915—EXPOSED TO 1916

1	3,457	19	21.562	88.0	232,012,450	1,219,300	1,443,649	84.5
2	2,100	15	18.806	79.8	135,969,900	920,000	1,186,787	77.5
3	1,902	16	18.566	86.2	119,969,000	969,300	1,164,717	83.2
4	1,605	24	17.152	139.9	99,628,700	1,562,500	1,062,885	147.0
5	1,382	18	15.929	113.0	85,335,300	999,100	981,025	101.9
1–5	10,506	92	92.015	100.3	672,016,250	5,670,200	5,839,063	97.0
6–10	4,811	66	68.618	96.4	293,471,000	4,142,800	4,158,512	99.4
11–15	3,016	71	59.301	120.0	180,655,500	4,227,800	3,518,268	120.1
16–20	1,617	51	43.106	118.3	96,008,700	2,930,300	2,554,580	114.9
21 & Ov.	466	20	18.378	108.8	27,646,400	1,045,000	1,136,734	92.0
1–31	20,416	300	281.418	106.8	1,269,797,850	18,016,100	17,207,157	104.7
6–31	9,910	208	189.403	109.8	597,781,600	12,345,900	11,368,094	108.6

A study of Class I by ages at issue shows that the improvement in mortality which has taken place at the different periods has not been uniform at all ages. In the age-group 20–29, the number of deaths is too small to justify any conclusion. Only in the age-groups 30–39 and 60 and over has the improvement been uniform. By amounts of insurance the percentage of losses shows a uniform improvement only in the age-group 60 and over. At the younger ages, the improvement observed in the second period is not continued in the third period. Combining all the three periods the percentages of deaths for the five age-groups, 15–29, 30–39, 40–49, 50–59, and 60 and over, are respectively 150%, 130%, 108%,

104%, and 74%; and the percentages of losses for the same age-groups are respectively 152%, 144%, 102%, 100%, and 70%. This high mortality ratio for ages at entry under forty is seen in the first five policy years as well as in the later policy years. The good showing for ages 60 and over is doubtless due in part to the mortality table used. The qx for these older ages in the Medico-Actuarial Table seems too large for accurate analysis.

Coming to the experience by policy years, it is seen that in the first period—1885–1895—there is a low mortality in the first two policy years both by policies and amounts, the mortality ratio being 72% and 56% by policies and 69% and 59% by amounts for the first two policy years respectively. In the third policy year the ratio rises to 151% by policies and 154% by amounts, and in the fourth policy year it rises still higher to about 200%. After the fifth policy year the percentages come down but in no case is it less than 100% by policies and in only one case, 21 years and over, is the ratio less than 100% by amounts. In the second period—1896–1905—the first three policy years show a very favorable mortality both by number and by amount, and policy years 6–10 are likewise favorable; in policy years four and five and also above the eleventh, the mortality ratios are above 100%. In the third period—1906–1915—the first year mortality ratio is 162% by policies and 165% by amounts, but in policy years 2–5 combined the ratio is 65% by number and 76% by amount. In policy years 6–10 the mortality ratio rises to 123% by number and 110% by amount. For the three periods combined—1885–1915—the first three policy years show a favorable mortality by policies and amounts, but at the subsequent policy years the mortality fluctuates, being 127% by policies and 126% by amounts for policy years four and five combined. In policy years 6–10 it is 96% by policies and 99% by amounts, but it rises again in policy years 11–20 to 119% by policies and 118% by amounts. Above the twentieth year the actual deaths are 109% of the expected and the actual losses are 92% of the expected.

TABLE D

Class II—Over $100,000 and Including $250,000

Summary by Ages at Issue, All Policy Years Combined

Issues of 1885–1895—Exposed to 1916

Ages	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
20–29	2	..	.007	....	$263,100	$.....	$921	....
30–39	26	..	.192	....	2,070,400	.....	21,399	....
40–49	57	1	.952	....	6,283,000	113,000	104,319	108.4
50–59	71	3	2.658	112.8	8,020,300	338,700	299,705	112.8
60 & Ov.	..	..	.....	....	.....	.....	.....	....
Total	156	4	3.809	104.8	17,536,800	451,700	426,344	106.1

Issues of 1896–1905—Exposed to 1916

20–29	64	..	.332	....	9,527,000	.....	48,404	....
30–39	304	1	1.967	50.8	42,458,100	30,600	277,497	11.3
40–49	389	5	4.163	120.0	49,387,700	658,300	506,404	130.3
50–59	224	5	5.189	96.5	31,226,600	732,500	717,334	101.8
60 & Ov.	21	..	1.524	....	2,099,800	.....	150,030	....
Total	1,002	11	13.175	83.5	134,699,200	1,421,400	1,693,729	83.9

Issues of 1906–1915—Exposed to 1916

20–29	23	..	.107	....	3,343,000	.....	15,119	....
30–39	118	2	.609	328.0	17,217,000	260,000	87,427	296.4
40–49	157	2	1.234	162.0	24,251,400	410,000	192,590	212.8
50–59	88	1	1.614	62.0	15,388,700	150,000	295,777	50.7
60 & Ov.	6	..	.214	....	968,000	.....	35,384	....
Total	392	5	3.778	132.5	61,168,100	820,000	626,306	131.2

Issues of 1885–1915—Exposed to 1916

20–29	89	..	.446	....	13,133,100	.....	64,504	....
30–39	448	3	2.768	108.3	62,645,500	290,600	380,323	76.4
40–49	603	8	6.340	125.6	79,922,100	1,181,300	803,322	147.7
50–59	383	9	9.461	95.4	54,635,600	1,221,300	1,312,816	93.1
60 & Ov.	27	..	1.738	....	3,067,800	.....	185,414	....
Total	1,550	20	20.762	96.2	213,404,100	2,693,100	2,746,379	98.0

TABLE D—*Continued*

SUMMARY BY POLICY YEARS, ALL AGES COMBINED

ISSUES OF 1885–1895—EXPOSED TO 1916

Policy Years	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposure	Death-claims: Actual	Death-claims: Expected	Ratio
1	19	..	.130	....	2,288,000	.....	15,284	....
2	10	..	.111	....	1,118,300	.....	12,454	....
3	9	1	.116	862.0	1,005,300	113,000	12,877	876.9
4	8	..	.115	....	892,300	.....	12,892	....
5	8	..	.125	....	892,300	.....	14,028	....
1–5	54	1	.597	168.0	6,196,200	113,000	67,535	167.2
6–10	35	..	.746	....	3,896,500	.....	83,455	....
11–15	34	2	1.098	182.2	3,783,500	225,700	122,838	183.7
16–20	23	1	.846	118.0	2,542,000	113,000	94,063	119.8
21 & Ov.	10	..	.522	....	1,118,600	.....	58,453	....
1–31	156	4	3.809	104.8	17,536,800	451,700	426,344	106.1
6–31	102	3	3.212	93.6	11,340,600	338,700	358,809	94.5

ISSUES OF 1896–1905—EXPOSED TO 1916

1	134	2	.815	236.0	20,137,600	140,500	126,600	111.0
2	92	1	.778	129.0	12,676,700	150,000	104,925	143.0
3	87	2	.789	254.0	12,103,800	310,500	108,947	285.0
4	76	..	.741	....	10,095,800	.....	95,974	....
5	71	2	.756	264.0	9,556,400	300,400	98,707	303.4
1–5	460	7	3.909	179.2	64,570,300	901,400	535,153	168.6
6–10	291	..	3.924	....	37,273,900	.....	487,116	....
11–15	191	4	3.553	112.8	24,765,700	520,000	447,077	117.5
16–20	60	..	1.789	....	8,089,300	.....	229,383	....
1–20	1,002	11	13.175	83.5	134,699,200	1,421,400	1,693,729	83.9
6–20	542	4	9.266	43.2	70,128,900	520,000	1,158,576	44.9

ISSUES OF 1906–1915—EXPOSED TO 1916

1	94	..	.611	....	14,761,000	.....	97,564	....
2	81	1	.720	139.0	12,507,800	110,000	113,671	96.8
3	66	1	.630	159.0	10,634,600	210,000	105,636	198.9
4	48	..	.539	....	7,691,100	.....	92,394	....
5	39	1	.430	233.0	5,971,600	150,000	71,638	210.0
1–5	328	3	2.930	102.3	51,566,100	470,000	480,893	97.8
6 & Ov.	64	2	.848	236.0	9,602,000	350,000	145,413	240.8
1–10	392	5	3.778	132.5	61,168,100	820,000	626,306	131.2

TABLE D—*Continued*

ISSUES OF 1885–1915—EXPOSED TO 1916

Policy Years	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
1	247	2	1.586	126.2	37,186,600	140,500	239,448	58.7
2	183	2	1.609	124.4	26,302,800	260,000	231,050	112.6
3	162	4	1.535	260.4	23,743,700	633,500	227,450	279.4
4	132	..	1.395	....	18,679,200	.....	201,260	....
5	118	3	1.311	228.9	16,420,300	450,400	184,373	244.1
1–5	842	11	7.436	147.4	122,332,600	1,484,400	1,083,581	137.0
6–10	390	2	5.518	36.2	50,772,400	350,000	715,084	49.0
11–15	225	6	4.651	129.0	28,540,200	745,700	564,915	132.0
16–20	83	1	2.635	37.9	10,631,300	113,000	323,440	35.0
21 & Ov.	10	..	.522	....	1,118,600	.....	58,453	....
1–31	1,550	20	20.762	96.2	213,404,100	2,693,100	2,746,379	98.0
6–31	708	9	13.326	67.5	91,071,500	1,208,700	1,662,798	72.6

The numbers in these three groups of Class II are too small to admit of any extended analysis. It may be said though that selection seems to have been better in Class II than in Class I.

TABLE E

CLASS III—OVER $250,000

SUMMARY BY AGES AT ISSUE ALL POLICY YEARS COMBINED

ISSUES OF 1896–1905—EXPOSED TO 1916

Ages	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
20–29	....	..	....	....	.....	.....	.....	....
30–39	57	1	.401	249.0	$34,281,200	$1,000,000	$257,908	388.0
40–49	82	..	.933	....	49,236,000	.....	504,313	....
50–59	16	3	.252	....	7,200,000	1,575,000	87,697	....
60 & Ov.	5	..	.155	....	1,500,000	.....	46,350	....
Total	160	4	1.741	229.6	92,217,200	2,575,000	896,268	288.4

TABLE E—*Continued*

ISSUES OF 1906–1915—EXPOSED TO 1916

Ages	On Applications: Expos.	Deaths: Act.	Deaths: Expected	Ratio	On Amounts: Exposures	Death-claims: Actual	Death-claims: Expected	Ratio
20–29	4	..	.018	.....	1,600,000	.....	6,840	.....
30–39	10	..	.050	.....	4,223,000	.....	20,885	.....
40–49	26	..	.104	.....	8,120,000	.....	59,910	.....
50–59	1	1	.009	11100.0	273,300	273,300	2,487	10986.7
60 & Ov.	....	..	....	.....	.....	.....	.....	.....
Total	41	1	.271	369.0	14,217,200	273,300	90,131	303.4

ISSUES OF 1896–1915—EXPOSED TO 1916

20–29	4	..	.018	.....	1,600,000	.....	6,840	.....
30–39	67	1	.451	222.0	38,505,100	1,000,000	278,703	358.0
40–49	108	..	1.127	.....	57,356,000	.....	564,232	.....
50–59	18	4	.270	1480.0	7,925,300	1,848,300	94,297	1959.2
60 & Ov.	5	..	.155	.....	1,500,000	.....	46,350	.....
Total	202	5	2.021	247.5	106,886,400	2,848,300	990,512	287.7
Deduct reinsurance					70,287,900	1,792,700	609,081	294.0
Total					36,598,500	1,055,600	381,431	276.6

SUMMARY BY POLICY YEARS, ALL AGES COMBINED

ISSUES OF 1896–1905—EXPOSED TO 1916

Policy Years								
1	27	1	.176	568.0	13,848,200	500,000	88,812	565.0
2	15	1	.144	694.0	8,613,000	1,000,000	75,099	1330.0
3	14	..	.144	.....	7,613,000	.....	68,523	.....
4	12	..	.136	.....	6,383,000	.....	56,974	.....
5	12	..	.147	.....	6,383,000	.....	61,094	.....
1–5	80	2	.747	268.0	42,840,200	1,500,000	350,502	427.5
6–10	45	1	.505	198.0	27,265,000	75,000	261,559	28.7
11–15	28	..	.360	....	17,968,000	.....	220,898	.....
16–20	7	1	.120	833.0	4,144,000	1,000,000	63,309	1580.0
1–20	160	4	1.741	229.6	92,217,200	2,575,000	896,268	288.4
6–20	80	2	.994	202.0	49,377,000	1,075,000	545,766	19.76

TABLE E—*Continued*

ISSUES OF 1906–1915—EXPOSED TO 1916

1	10	1	.049	2040.0	3,614,600	273,300	17,292	1579.7
2	9	..	.056	.....	3,091,300	.....	18,345	.....
3	8	..	.052	.....	2,926,300	.....	18,271	.....
4	6	..	.044	.....	2,275,000	.....	15,913	.....
5	4	..	.035	.....	1,160,000	.....	10,270	.....
1–5	37	1	.236	424.0	13,057,200	273,300	80,091	341.6
6 & Ov.	4	..	.035	.....	1,160,000	.....	10,040	....
1–10	41	1	.271	369.0	14,217,200	273,300	90,131	303.4

ISSUES OF 1896–1915—EXPOSED TO 1916

1	38	2	.234	854.0	17,914,800	773,300	110,217	701.4
2	24	1	.200	500.0	11,704,300	1,000,000	93,444	1070.0
3	22	..	.196	.....	10,529,300	.....	86,794	.....
4	18	..	.180	.....	8,658,000	.....	72,887	.....
5	16	..	.182	.....	7,543,000	.....	71,364	.....
1–5	118	3	.992	303.0	56,349,400	1,773,300	434,706	407.9
6–10	49	1	.540	185.0	28,425,000	75,000	271,509	27.6
11–15	28	..	.369	.....	17,968,000	.....	220,898	.....
16–20	7	1	.120	833.0	4,144,000	1,000,000	63,309	1580.0
21 & Ov.	...	..	....	.....	.....	.....	.....	.....
1–31	202	5	2.021	247.5	106,886,400	2,848,300	990,512	287.7
6–31	84	2	1.029	194.4	50,537,000	1,075,000	555,806	193.5
Deduct reinsurance					70,287,900	1,792,700	609,081	294.0
Total					36,598,500	1,055,600	381,431	276.6

In Class III also the data are too few to justify any analysis. As there were no risks issued for an amount above $250,000 before 1896 the observation extends only to two periods, 1896–1905 and 1906–1915. The selection seems to have been distinctly against the Company in both periods. It seems appropriate to insert here the remark that we too have suffered by reinsuring risks from other companies in the United States to the extent of 186% of the expected to the actual losses.

The causes of death and the ratio per 10,000 exposures among the large risks are set forth in the following table, together with the ratio per 10,000 exposures in the general experience of the Company among men insured in the United States and Canada.

TABLE F

DEATHS BY CAUSE AMONG MEN INSURED FOR $50,000 AND UPWARDS ON ONE APPLICATION, WITH THE RATIO PER 10,000 EXPOSURES
Issues of 1885–1915—Exposed to 1916

CAUSE OF DEATH	Number terminated by Death — Ages at Entry: All Ages	15 to 29	30 to 44	45 & Ov.	Ratio per 10,000 Exposures — Ages at Entry: All Ages	15 to 29	30 to 44	45 & Ov.	GENERAL EXPERIENCE Issues of 1885–1914 exposed to 1915 — Ratio per 10,000 Exposures — Ages at Entry: All Ages	15 to 29	30 to 44	45 & Ov.
Typhoid fever	4	1	2	1	1.8	4.8	1.8	1.2	4.1	5.0	3.5	3.1
Malarial fever	...	...	...	...	...	...	...	...	.8	.5	.9	1.6
Influenza	2	...	...	2	.9	...	...	2.3	1.0	.4	.9	3.2
General Diseases A.	8	1	2	5	3.6	4.8	1.8	5.8	6.9	6.6	6.3	10.2
Tuberculosis	15	4	6	5	6.8	19.0	5.3	5.8	9.1	10.9	7.9	7.7
Cancer	23	...	7	16	10.4	...	6.2	18.4	4.3	1.1	4.3	16.1
Diabetes	5	...	2	3	2.3	...	1.8	3.5	1.4	.6	1.4	3.8
Alcoholism	1	...	...	1	.5	...	...	1.2	.5	.4	.6	.6
General Diseases B.	52	5	18	29	23.5	23.8	15.8	33.4	17.5	14.3	16.6	32.9
Apoplexy, Paralysis and Soft. of the Brain	34	...	13	21	15.4	...	11.4	24.2	6.9	1.3	6.2	29.3
General Paresis of Insane & Insanity	5	1	3	1	2.3	4.8	2.6	1.2	1.4	.7	1.6	2.6
Total Nervous Dis.	49	1	19	29	22.1	4.8	16.7	33.4	10.7	3.7	10.4	36.5
Heart Disease	23	1	6	16	10.4	4.8	5.3	18.4	6.6	1.6	5.7	27.7
Angina Pectoris	12	...	2	10	5.4	...	1.8	11.5	1.3	.1	.9	5.4
Arterio-Sclerosis	15	...	2	13	6.8	...	1.8	15.0	.7	.1	.4	2.8
Total Circulatory Dis.	57	1	13	43	25.8	4.8	11.4	49.5	10.3	2.4	9.0	43.1
Pneumonia	26	2	9	15	11.8	9.5	7.9	17.3	6.3	3.3	6.4	16.9
Total Respiratory Dis.	33	2	13	18	14.9	9.5	11.4	20.7	7.8	3.8	7.7	22.0
Diseases of Liver & Gall Bladder	9	1	1	7	4.1	4.8	.9	8.1	2.3	.7	2.3	6.9
Appendicitis & Peritonitis	11	...	6	5	5.0	...	5.3	5.8	2.5	2.4	2.5	3.1
Total Digestive Dis.	29	1	12	16	13.1	4.8	10.6	18.4	7.4	4.2	7.1	18.5
Bright's Disease	41	1	16	24	18.5	4.8	14.1	27.6	6.4	2.0	6.5	21.2
Total Genito-Urinary Dis.	45	1	17	27	20.3	4.8	15.0	31.1	7.3	2.1	7.0	26.5
Suicide	19	1	6	12	8.6	4.8	5.3	13.8	2.7	1.8	3.1	4.3
Casualties	24	2	14	8	10.8	9.5	12.3	9.2	5.7	5.2	5.5	8.5
Total Deaths from all causes	325	15	118	192	146.9	71.4	103.8	220.8	78.8	45.5	75.6	210.1

Owing to the fact that the average age at entry among the large cases was 42.0 years, while in the general domestic experience of the Company it was 32.8 years, 9.2 years younger, a higher death rate among the large cases from degenerative diseases was expected. However, after allowing for this difference in the average age at entry, the large risks show fewer deaths from acute infectious diseases, especially typhoid fever. They also show a lower death rate from tuberculosis for ages above 29, but almost double for ages at issue under 30. Cancer is a little heavier at all ages and apoplexy, paralysis, and softening of the brain are greater in the age period 30–44 but less in the age period 45 and over. The death rate from heart disease is lower above age 29 among the large risks but notably higher from angina pectoris and arteriosclerosis. Pneumonia is somewhat higher among the large cases and Bright's disease and diseases of the genito-urinary apparatus are decidedly so. Suicide and casualties are also more prevalent at all ages.

In his actuarial essay "On the Effects of Selection," Emory McClintock—than whom there has never been a more capable actuary—says: "It has been remarked that entrance-selection comprises three classes of agencies: the interested intrusion of unsound lives, the efforts made by the office to resist such intrusion, and the appeals made to different classes of proposers by the offices and their agents."

In the study of applicants for large amounts the intrusions may be divided into several varieties.

A.—Risks who are sound physically but bad financially. This class includes those who take out very large amounts of insurance with the definite idea of terminating life before the next premium comes due.

A company tries to prevent these risks (1) by excluding applicants for large amounts from the cheap term insurance; (2) by insisting on full annual premiums for large policies; (3) by incorporating a suicide clause in the contract; (4) by rigid investigation of the finances. None of these is very satisfactory. The second is met by the risk giving a note to

the agent who is able to discount it at his bank. The third is satisfied by making the exitus appear accidental, thereby forcing the claim at the best to a trial by jury on a question of fact, and we all know the result in such a procedure. The fourth step, the investigation of the finances, is most difficult and often very unsatisfactory. The ordinary mercantile agencies base many of their reports upon information furnished by the risk himself. Banks and bankers are sometimes greatly influenced by notes which they may be carrying for the risk or his corporation. They may even give a clean financial bill of health in the very hope that the insurance may furnish the family with sufficient money to pay off their claim on the estate. A financial statement by the risk himself is of very little value unless it can be incorporated with the policy and made part of the contract. Tardiness and failure in paying "the butcher, the baker, and the candlestick maker" are very definite financial defects in an applicant for a large amount.

B.—Risks who are sound physically and whose finances are moderate but who take more insurance than they can really afford. He may take the excessive insurance because he has prospects of increased income in the future, and the immediate cheapness of the insurance appeals to him. The same precaution should be taken in this type of risk as in A. If he is disappointed in his prospects, there may be a temptation to resort to suicide when the second premium comes due. The usual suicide clause, covering a year, will tend to prevent this and the risk will either lapse his policy or by hard scratching pay his second premium. If his finances fail to improve after that, the temptation is always present when a premium comes due, to make secure the provision for his family which his imagination, hopes, and altruism had anticipated when he took out the insurance. He has been known to convert his policies into extended term insurance and then commit suicide shortly before the date of expiry. Intrusions of this class therefore may affect the mortality rate for some years after entrance while those of Class A ripen in the first policy year.

C.—Risks who are sound physically and financially but whose alcoholic habits are bad.

Theoretically we ought to reject risks for large amounts when the alcoholic habits are in doubt even more promptly than when the application is small. Practically I wonder if we do apply this rule rigidly. It is not difficult to get abundant testimony from people who never saw the applicant drunk or even drinking. The standard of alcoholic excess differs in different grades of society and in different social sets in the same grade. Furthermore every friend of the applicant will tend to minimize his alcoholic excesses, and if some unfriend reports that the habits are bad, the cry is raised that his report is prejudiced. The temptation to present this favorable testimony is greater, the larger the premium. A large volume of it tends to confuse the mind of any layman who reads the correspondence. Sometimes even a medical director is carried away by it, forgetting that an ounce of positive testimony is worth a ton of negative testimony in such a matter. In other cases it seems to be impossible to get an accurate idea of the alcoholic habits of a risk, even with the most careful inspection and investigation. This applies particularly to men of power and wealth who are determined that the public shall not know of their secret vice. When such a risk desires insurance, he usually seeks a large amount. It is not surprising that when the case becomes a death-claim, we are able to secure full and reliable information about alcoholic excesses, which had been entirely concealed. But postmortem information of this kind is rarely of much help to the Company.

In the Medico-Actuarial Mortality Investigation the habits as to alcoholics were divided into several classes. Of these, Class 18, "Steady Free Users of Alcohol," was by far the most numerous. In the Mutual Life this was defined so as to include anyone who stated in his application that he used alcohol daily or whose habits in the course of our investigation were shown to involve the daily use of alcohol. In other words these risks were men who at the time of examination

drank daily but had never drunk to excess, so far as we could ascertain. If we got any history of ever drinking to excess, they were put in Class 17 instead of Class 18. Cases with such a history of excessive drinking only numbered 14 all told among the risks for large amounts, and the percentage of their frequency was very much lower than in the general experience of the Company.

The following table shows the experience of the Company in Class 18, "Steady Free Users of Alcohol," which as interpreted above means men who drink daily but never to excess.

TABLE G

DISTRIBUTION OF CLASS 18 AMONG THE GENERAL EXPERIENCE OF THE COMPANY AND AMONG RISKS FOR LARGE AMOUNTS WITH THE RATIO OF ACTUAL TO EXPECTED DEATHS AND LOSSES

	Percentage of Distribution		Ratio of Actual to Expected	
	Applications	Amounts	Applications	Amounts
Issues of 1885–1906 General Experience	6.0	9.1	120.9	....
" " 1907–1914 " "	7.4	10.3	86.0	71.0
Total 1885–1914 " "	6.4	9.4	116.4	....
Issues of 1885–1905 Large Risks	16.6	16.6	123.2	148.6
" " 1906–1915 " "	16.1	15.9	79.8	81.0
Total 1885–1915 " "	16.4	16.4	117.2	138.9

In both the early and recent periods the proportion of "Steady free users of Alcohol" is very much larger among the applicants for large amounts than in the general experience. In the recent period our investigation and inspection of all applicants, both for small and large amounts, has been much more thorough than in the early period. This accounts for the higher percentage as well as for the lower mortality in the recent period. The difference between the larger risks and the smaller risks in both periods is due in part to the fact that the large risks are more thoroughly investigated and

more accurate knowledge of alcoholic habits is thereby obtained. After making allowance for this there seems no doubt that the applicants for large amounts partake of alcohol more freely than the average of insured risks, though those who drink to excess are less frequent.

D.—Risks who are sound financially but who conceal a medical impairment either past or present. These constitute a large class in all grades of insurance, but it seems reasonable to suppose that they will be more abundant proportionately among applicants for large amounts. These risks are regularly men of intelligence and force but often their success in life has been obtained by the use of rather low ethical standards. They regard insurance as personally useless until some defect arises, which prevents their getting insurance because it will probably shorten life. Insurance then becomes desirable and their superior intelligence and finances enable them to put themselves temporarily in apparent sound physical condition better than the average applicant. This is an assumption not based upon any definite statistics but upon a very distinct impression. Now the impression may be very distinct solely because of the very large amounts involved when these risks were caught *in flagrante delictu* but the statements above given seem reasonable and give strength to the impression. All companies act upon this impression by requiring a more elaborate medical examination of risks for large amounts. Usually two examinations are made by different examiners, two specimens of urine are obtained on different days or at different hours, and the urine is analyzed with greater care both chemically and microscopically. A careful investigation and inspection by trained lay inspectors is usually obtained. If we are informed that other companies are working on the risk at the same time, we communicate with them to ascertain if they have discovered any impairment. This sometimes secures valuable information. All these measures weed out a certain number of undesirables in this group. Unfortunately if an impairment is uncovered, this type of applicant will seek in every way to

minimize its importance or even cover it up again. He has the ability and the means, and knows often just how close he can shave the margin of the law. The stimulus of a large commission leads the agent to assist the applicant in this course. Doubtless some of these cases bluff their way through to the issuance of a policy even after partial knowledge of some impairment has developed. Companies which issue substandard policies have somewhat the advantage in this class, though I imagine they are sometimes very hard pressed to change the rating of a risk of this type.

On analyzing these various classes of Medical Impairments as defined by the Medico-Actuarial Committee, we found that the applicants for large amounts had a somewhat large proportion who showed impairments, 49.9% as compared with 32.1% in the general experience of the Company.

The number of risks in the individual classes of Medical Impairments was too small to admit of any analysis. For example all the abnormal ingredients of the urine only furnished 142 cases, covering all periods of time at and prior to examination. Altogether these showed 9 actual deaths and 7.05 expected, a mortality ratio of 127.8%. A history of hepatic colic was quite infrequent but renal colic was rather common, 24 cases in the earlier period and 13 in the recent period, about 1% of the entrants in each period and five times as frequent as the general experience of the Company. Thirty-nine risks showed large abdomen in the earlier period but only 3 in the recent period. Hernias were just about as frequent in the large risks as in the general experience of the Company. A history of appendicitis without operation was less common among the large risks but the appendectomies were more than twice as frequent. In the period since 1905 forty-six of our large risks had had the appendix removed, 3.9% as against 1.7% in the general experience of the Company in the same period.

It seems that the more careful examination and inspection of large risks bring to light a considerable number of impairments which are not ordinarily noted among the applicants

for smaller amounts. Furthermore when an applicant for a large amount has been disapproved, even temporarily, by one company, the tendency is to hustle him to another company in the endeavor to secure his prompt acceptance. Sometimes the other company issues insurance with a full knowledge of the findings of the first company which are then recorded as impairments. This happens to some extent with all disapproved applicants but the proportion is much larger when the application for is $50,000 and upwards. We all know how much time we give daily to the constant review of such cases and to the reiterated appeals which are made for them.

E.—In the matter of weight the Mutual Life prior to 1903 accepted overweights quite freely but since then we have become more conservative. The following table shows the proportionate distribution among the different Build-groups as defined by the Medico-Actuarial Committee. These have been divided into age-groups for two periods of issue, 1885–1906, and 1907–1913. The ratio of actual to expected deaths has been inserted in parallel adjacent columns. The first half of the table refers to the general experience of men insured by the Company in the United States and Canada and in these sections the issues of 1885–1906 were exposed to 1915 and the issues of 1907–1913 were exposed to 1914. The latter half refers to risks issued for $50,000 and upwards, the subject-matter of this paper. In these sections the periods of issue were 1885–1905, and 1906–1915, both exposed to 1916. You will see by this that the periods of issue and exposure are not identical but are near enough to make the comparisons fairly reliable. A word of caution should be said in regard to overweights. These regularly show a low mortality for the first five or ten years as compared with a total mortality for thirty years or more. We must make allowance for this, even if the mortality table used has a select qx for the first five years.

TABLE H

DISTRIBUTION OF ENTRANTS BY AGES AT ISSUE AND BY BUILD GROUPS AMONG THE GENERAL EXPERIENCE OF THE COMPANY AND AMONG RISKS FOR LARGE AMOUNTS, TOGETHER WITH THE RATIO OF ACTUAL TO EXPECTED, ACCORDING TO THE M. A. TABLE

ISSUES OF 1885–1906—EXPOSED TO 1916. GENERAL EXPERIENCE ON APPLICATIONS

Ages at Entry	Build 8		Build 7		Build 6		Build 0		Build 1		Build 2		Build 3		Build 4	
	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio	Distribution	Mort. Ratio
15–19	2.2	51	26.4	109	46.9	96	21.0	87	3.0	104	.4	97	.1	130	...	...
20–29	.3	132	13.9	114	42.2	95	31.7	87	8.8	93	2.4	102	.6	118	.1	178
30–39	.2	118	9.2	103	32.2	97	32.8	93	15.9	104	6.9	124	2.2	150	.6	187
40–49	.1	84	6.7	102	25.6	87	31.8	90	19.8	106	10.7	129	4.0	158	1.2	173
50–59	.2	64	6.2	91	22.4	84	30.5	91	21.4	104	12.5	116	5.0	133	1.7	150
60 & Ov.	.1	44	6.7	88	22.6	85	29.7	94	21.6	97	12.2	101	5.3	107	1.7	118
Total	.3	98	11.1	106	35.1	92	31.7	91	13.6	103	5.7	120	2.0	143	.5	165

Ages	ISSUES OF 1907–1913—EXPOSED TO 1914. GENERAL EXPERIENCE															
15–19	4.3	90	30.5	69	43.3	73	18.4	77	2.8	61	.6	101	.1	373	...	...
20–29	.5	95	14.6	78	41.4	67	30.9	65	9.2	63	2.7	63	.6	64	.1	107
30–39	.3	77	9.2	80	30.5	66	32.3	66	17.3	72	8.0	74	2.1	76	.3	80
40–49	.2	140	6.2	75	23.3	79	31.1	72	22.0	69	12.9	65	3.6	98	.7	70
50–59	.1	278	5.6	96	20.5	55	30.1	76	24.1	89	14.7	83	4.2	89	.7	42
60 & Ov.	.3	...	5.9	59	20.7	61	31.3	86	25.3	57	12.6	75	3.6	34	.3	...
Total	.6	99	11.9	78	33.5	68	30.5	71	14.6	72	6.8	73	1.8	83	.3	63

Ages	ISSUES OF 1885–1905—EXPOSED TO 1916. LARGE RISKS															
15–19	...	...	20.0	...	60.0	...	20.0	...	...	...	...	...	...	...	...	...
20–29	...	...	10.7	320	35.7	60	30.4	183	14.4	112	7.2	...	1.1	...	.4	...
30–39	.1	...	8.0	282	25.4	108	27.3	120	22.1	90	11.7	155	4.0	119	1.3	...
40–49	.1	...	4.2	83	15.8	100	26.0	97	26.8	126	17.3	113	7.7	129	1.9	261
50–59	.5	...	2.0	59	10.8	96	22.8	91	28.3	109	23.7	119	9.0	109	2.9	183
60 & Ov.	...	...	4.0	90	10.7	120	22.7	71	28.0	64	21.3	81	9.3	100	4.0	...
Total	.2	...	5.8	143	20.0	99	26.2	99	24.3	107	15.6	113	6.1	115	1.8	129

Ages	ISSUES OF 1906–1915—EXPOSED TO 1916. LARGE RISKS															
15–19	...	...	14.3	...	14.3	...	42.9	...	28.6	...	...	...	...	...	...	...
20–29	...	...	18.7	...	34.7	568	22.7	380	14.6	676	6.7	...	1.3	...	1.3	...
30–39	.8	...	5.1	...	24.2	136	32.5	129	25.9	172	9.3	147	2.7	...	.5	...
40–49	...	...	4.1	138	14.0	107	27.2	...	28.2	119	16.9	45	7.4	180	2.3	...
50–59	.5	...	3.2	...	8.2	168	28.8	48	27.0	195	20.6	98	9.1	82	2.7	...
60 & Ov.	...	...	...	...	3.8	...	19.3	...	27.7	38	15.4	...	3.8	...	...	...
Total	.3	...	5.1	57	17.7	185	28.8	51	26.7	140	1.44	75	5.7	107	1.7	...

In both periods the large risks show much higher proportion of entrants in those Build-groups which are above the average weight, Build-groups 1, 2, 3, and 4. This holds true for the younger ages, 20–29, as well as for the older ages. On the other hand Build-groups 2, 3, and 4 show a decidedly smaller mortality among the large risks of the earlier period than in the general experience of that time, and this is true at practically all ages. In the recent period the mortality ratios of Build-groups 1, 2, 3, and 4 is quite low in the general experience and also among the large risks, with the exception of Build-group 1. This is entirely to be expected for overweights show excellent results in the first five or ten years of exposure if the medical examinations have been thorough and exact. The deaths of this recent period come from 7 first-policy-years, 6 second-policy-years, 5 third-policy-years, 4 fourth-policy-years, 3 fifth-policy-years, 2 sixth-policy-years, and only 1 seventh-policy-years, that 1 being of the small issues of 1907. Furthermore the number of deaths among the large risks in the recent period is only 42, a very small number when divided into eight Build-groups. After making all these allowances it is fair to say that the selection among overweights in the recent period has not been poor, either in the general experience or among the large risks.

Risks for large amounts are plumper than in the general experience of the Company, but by the extra care in examination and in selection the mortalities have been kept down below what we would ordinarily expect. This is true even after thirty years of exposure. These fat ones do not become good risks but they are less bad than in the general experience of the Company.

The following table—Table J—shows certain causes of death for each of the Build-groups in the older period. It gives the actual number of deaths and the rate per 10,000 exposures and in an adjacent column the rate per 10,000 exposures for the corresponding cause among the entrants in the same Build-group in the general experience of the Company.

TABLE J

DEATHS BY CAUSE AND THE RATE PER 10,000 EXPOSURES FOR EACH OF ISSUES OF 1885–1905—

	Build 7			Build 6			Build 0		
	Large Risks		General Experience	Large Risks		General Experience	Large Risks		General Experience
	Deaths	Rate per 10M	Rate per 10M	Deaths	Rate per 10M	Rate per 10M	Deaths	Rate per 10M	Rate per 10M
Typhoid Fever			4.9			4.1	2	4.5	4.3
Malarial Fever			1.1			.9			.8
Influenza			1.3			.9			.9
General Disease A			8.5	1	2.9	7.0	2	4.5	6.9
Tuberculosis	2	19.7	10.3	3	8.8	12.9	2	4.5	7.1
Cancer	3	29.5	3.1	1	2.9	3.4	2	4.5	4.5
Diabetes			.6	1	2.9	.6			1.0
General Disease B	5	49.2	25.6	7	20.4	19.4	5	11.2	15.4
Apoplexy, Paralysis, and Softening of the Brain	2	19.7	3.2	6	17.5	4.3	3	6.7	6.7
General Paresis of Insane			.6	2	5.8	.9	2	4.5	1.0
Insanity			.5			.5			.6
Total Nervous Diseases	2	19.7	6.8	9	26.3	8.1	10	22.3	10.8
Heart Disease			3.5	2	5.8	4.2	5	11.2	6.6
Angina Pectoris			.7	1	2.9	.9	2	4.5	1.5
Arteriosclerosis			.6	4	11.7	.7	3	6.7	1.1
Total Circulatory Diseases			5.6	7	20.4	6.5	11	24.5	10.2
Pneumonia	2	19.7	7.4	3	8.8	6.2	6	13.4	6.1
Total Respiratory Diseases	3	29.5	8.8	4	11.7	7.5	7	15.6	7.5
Diseases of Liver and Gall Bladder			1.4			1.5	3	6.7	2.1
Appendicitis and Peritonitis	2	19.7	1.9	1	2.9	2.1	1	2.2	2.5
Total Digestive Diseases	4	39.3	5.7	1	2.9	5.9	7	15.6	7.2
Bright's Disease			3.5	4	11.7	3.9	5	11.2	5.8
Total Genito-Urinary Diseases			3.9	4	11.7	4.8	6	13.4	6.7
Suicides	2	19.7	2.8	2	5.8	2.5	6	13.4	2.7
Casualties	1	9.8	5.0	4	11.7	5.1	7	15.6	6.4
Total Deaths	18	176.9	74.8	39	113.9	69.3	64	142.7	76.5

TABLE J

THE BUILD GROUPS AMONG LARGE RISKS AND GENERAL EXPERIENCE EXPOSED TO 1916

	Build 1			Build 2			Build 3			Build 4		
	Large Risks		General Experience	Large Risks		General Experience	Large Risks		General Experience	Large Risks		General Experience
	Deaths	Rate per 10M	Rate per 10M	Deaths	Rate per 10M	Rate per 10M	Deaths	Rate per 10M	Rate per 10M	Deaths	Rate per 10M	Rate per 10M
			4.1			4.7			4.3			4.7
			.7			1.3			1.1			1.5
			1.1	1	3.8	1.3			1.8	1	26.5	2.5
1	2.2	7.2		1	3.8	8.5			9.2	1	26.5	10.3
4	8.8	3.6		2	7.7	2.6			2.2			2.7
1	2.2	0.5		6	23.0	8.4	4	35.1	7.9	1	26.5	10.1
3	6.6	2.3		1	3.8	4.8			9.9			11.3
10	22.1	15.6		11	42.1	19.7	4	35.1	24.8	2	53.0	29.0
6	13.3	12.1		6	23.0	18.7	4	35.1	25.9	1	26.5	33.5
1	2.2	1.4				1.2			1.7			2.2
		.7				.4			.3			.7
10	22.1	17.0		7	26.8	23.2	4	35.1	29.8	1	26.5	40.3
4	8.8	11.2		9	34.5	15.9			23.8	1	26.5	33.9
5	11.1	2.8		2	7.7	4.1	1	8.8	5.4			3.7
3	6.6	2.0		1	3.8	3.5	4	35.1	3.0			3.9
13	28.7	17.5		13	49.8	26.0	7	61.5	35.1	1	26.5	44.5
4	8.8	7.3		4	15.3	8.7	2	17.6	10.1	1	26.5	10.3
7	15.5	9.3		4	15.3	11.1	2	17.6	12.7	1	26.5	13.5
3	6.6	4.1		3	11.5	6.0			7.7			10.1
1	2.2	2.9		5	19.2	3.3			3.7	1	26.5	4.4
4	8.8	10.6		9	34.5	13.1			15.8	2	53.0	21.4
18	39.8	11.0		6	23.0	17.0	5	43.9	26.2	1	26.5	32.0
19	42.0	12.4		7	26.8	19.0	6	52.7	28.7	1	26.5	35.7
3	6.6	3.2				3.8			4.0	1	26.5	4.2
3	6.6	6.0		2	7.7	5.5			4.3			5.7
71	156.9	102.8		56	214.5	134.3	23	201.9	170.4	10	265.0	213.8

The light-weight groups, 6 and 7, show a high mortality in the early period. A careful study of the causes of death does not determine anything in Build-group 7. There are only two cases of tuberculosis, about the normal expectation. There were 3 deaths from cancer, but these occurred 9, 11, and 18 years after issue, so the light weight cannot be ascribed to a concealed cancer.

In Build-group 6 the deaths from tuberculosis only numbered 3 below the average. Unacknowledged syphilis was responsible for 3 deaths, one by the route of locomotor ataxia and the other two by way of general paresis, after durations of 7, 10, and 10 years. There was 1 death from diabetes, 6 from cerebral apoplexy, 2 from heart disease, 1 from angina pectoris, 4 from arteriosclerosis, and 4 from Bright's disease. These are all degenerative diseases and account for 46% of the deaths. This is much above the average, even if we make allowance for the older age at entry of the large risks. It is what we might expect in a group of marked overweights. The duration of all these cases was good, the shortest being seven years.

In fact, a careful study of this table shows that the degenerative diseases predominate. Even if we allow that the average age at entry for large risks was 42 years, degenerative diseases are much too numerous as a mode of exit. If we compare this table with Table F we see that this is true for all ages, and now it is found to be true for all build-groups.

F.—The very low mortality in the first policy year of the issues in Class I prior to 1906 requires explanation. The insurance business of this period was conducted under very different rules from those of the present time. The commissions were much larger and generally increased with the size of the application. Competition between the companies was very keen and not infrequently 90% or more of the first annual premium was paid to the agent who often rebated most of it to the applicant. These commissions became so excessive in November and December of each year, that our Company was accused of throwing in a sealskin overcoat with each $100,000

policy, and in reproof valiant we said that the Equitable and New York Life threw in a brown stone front with each of their large policies. In neither case was any premium supposed to be paid by the applicant. In some cases the policies were never actually delivered to the policyholder but were held by the agent who reaped the sealskin overcoat or the brown stone front without cost. The hope of the Company, whether the policy was actually delivered or not, was that these policyholders would be induced to pay the second premium a year later, and then the third, and so on. But this hope was a miserable delusion as the following table shows.

TABLE K

CLASS I.—$50,000 TO $100,000 ON ONE APPLICATION

ISSUES OF 1885–1906

Policy Years	Insured		Lapsed		Percentage of Lapses	
	Number	Amount	Number	Amount	Number	Amount
Jan. to Oct.	1,657	$112,230,000	607	$46,215,500	36.6	41.2
Nov. & Dec.	793	55,824,300	419	31,549,100	52.8	56.5
Total Pol. Yr. 1	2,450	$168,054,300	1,026	$77,764,600	41.9	46.3
" " " 2	1,416	89,734,200	143	10,102,200	10.1	11.2
" " " 3	1,264	79,187,000	135	9,322,800	10.7	11.7
" " " 4	1,117	69,134,100	64	4,368,100	5.7	6.3
" " " 5	1,034	63,553,500	52	3,597,300	5.0	5.6
" " " 1–5	7,281	$469,663,100	1,420	$105,155,000	19.5	22.4

I have divided the issues in this way for the conditions in November and December were regularly worse than in the rest of the year.

These applicants who lapsed their policies in the first year or at the end thereof were healthy and the actual mortality for the first policy year was therefore low.

The business however was effected at a substantial loss even if there had been no deaths at all in the first policy year. Perhaps some of them paid their premiums for the second and third years, and then took a reduced paid-up policy or

extended term insurance. This would account for the favorable mortality in the second and third policy years and the sharp increase thereafter. Most of them dropped their policies at the end of the first policy year and took out another large policy in another company at the same lack of cost to themselves. By the fourth or fifth year they would get back to us, their lapses would be forgiven and a large policy would again be issued with the same result if they were still sound at the end of the year. If the policyholder developed a serious impairment during the year he clung to his policy with great tenacity, especially if he was rejected by another company. In this way there was a continuous selection against the Company by these risks for large amounts. Since 1906 this business has been entirely stopped among the New York companies. Not only do the laws governing commissions practically forbid it but the companies themselves are wiser and thoroughly alert to the danger and uselessness of such methods. The effectiveness of these restraints is shown in the following table.

TABLE L

CLASS I.—$50,000 TO $100,000 ON ONE APPLICATION
NUMBER AND AMOUNT INSURED AND LAPSED WITH THE PERCENTAGE ISSUES OF 1907 TO 1915—EXPOSED TO 1916

Policy Years	Insured		Lapsed		Percentage of Lapses	
	Number	Amount	Number	Amount	Number	Amount
1	1,011	$64,729,150	130	$9,533,150	12.9	14.8
2	754	47,218,700	35	2,517,400	4.7	5.3
3	646	40,728,300	53	3,583,700	8.2	8.8
4	492	31,051,900	37	2,276,000	7.5	7.3
5	353	22,428,900	25	1,538,200	7.1	6.9
1–5	3,256	$206,156,950	280	$19,448,450	8.6	9.4

G.—As a result of our study, the following inferences may be drawn.

1. Applicants for large amounts regularly eat and drink more than the average and more than they ought to.

2. This class is more subject than the average to "the interested intrusion of unsound lives," whether this unsoundness be due to finances, health, or habits.

3. The most elaborate investigation will not always reveal the truth as to finances and habits, but the more rigid it is, the better is the result.

4. The most careful medical examination should be instituted to exclude the faintest beginnings of the degenerative diseases. Large risks are subject to these and die of them, even if they are young or lean.

5. Even with the utmost care in examination, investigation and selection, the large risks will not show as low mortalities as in the general experience of a first-class company among its standard lives, for they eat and drink too much.

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TITLE